Caution

As the LibreOffice Swarm Non-Linear Solver is an experimental tool, it may not be supported in future versions of Calc, and we recommend that you do not use it unless you are familiar with non-linear programming concepts.

The DEPS and SCO Evolutionary Algorithms are intended for solving non-linear problems - they are only available if you have a Java runtime environment installed on your computer and have enabled the **Tools > Options > LibreOffice > Advanced > Use a Java runtime environment** configuration option. The DEPS Evolutionary Algorithm is the initial default if it is available, while LibreOffice CoinMP Linear Solver is the initial default otherwise.

The available options provide flexibility to choose the most suitable algorithm for a given problem, which may be linear or non-linear, and a given performance requirement. The Help system contains much more information about the available algorithms and their configuration options.

In order to use the Solver to solve a mathematical programming problem, you must formulate the problem as follows:

- *Decision variables* – a set of *n* non-negative variables x*1*, … , x*n*,. Decision variables may be real numbers, but generally tend to be integers in many real world problems.
- *Constraints* – a set of linear equalities or inequalities involving the decision variables.
- *Objective function* – a linear expression involving the decision variables.

The goal is usually to find values of the decision variables that satisfy the constraints and maximize or minimize the result of the objective function.

Solver dialog

After setting up the data for the problem in your Calc spreadsheet, select **Tools > Solver** on the Menu bar to open the Solver dialog (Figure 326).

Note

Depending on the configuration of your computer, a message may be displayed the first time that you select **Tools > Solver** after starting Calc. The nature of this message will change dependent on the existence of a Java runtime environment (JRE) on your system. If no JRE is detected, the message will simply be a warning to that effect. In the case where a JRE is detected but the **Tools > Options > LibreOffice > Advanced > Use a Java runtime environment** option is disabled, then the message will include a button to enable that option.

Target cell
Type a cell reference to the objective function or select it with the mouse.

Optimize result to
Select **Maximum** to find the maximum result for the objective function, **Minimum** to find the minimum result, or **Value of** to set it to a specific value. If you select **Value of**, enter the required value or a reference to the cell containing that value.

By changing cells
Enter the locations of any cells that define your decision variables.

Limiting Conditions
Enter your constraints in the fields in this area:

– *Cell reference* – enter a cell reference to a decision variable.